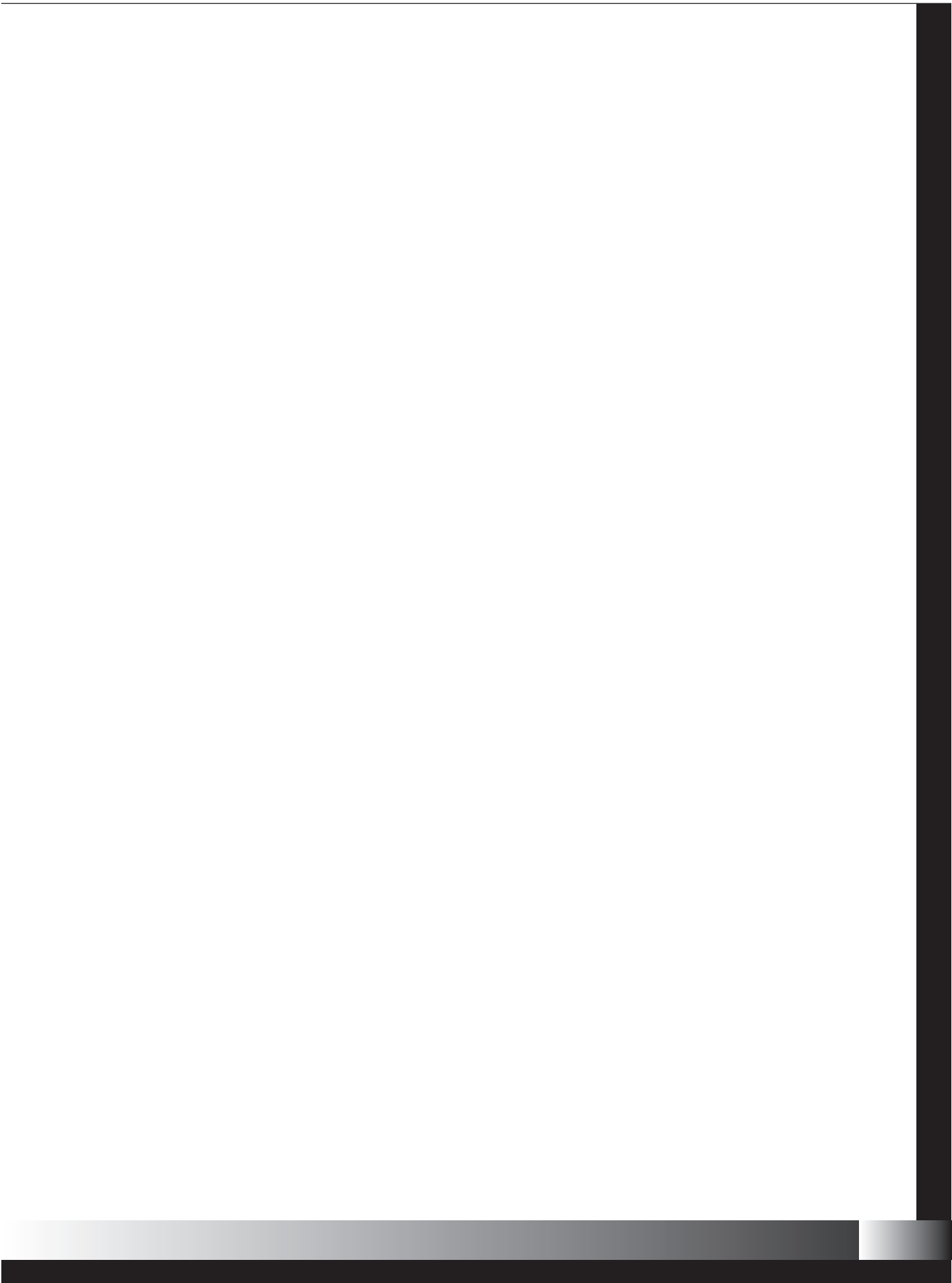




Chapter Four

AVIATION INDUSTRY TRENDS



Chapter Four

AVIATION INDUSTRY TRENDS

In preparing a comprehensive plan for the public-use airports in and around Pima County, it is important to have a general understanding of recent and anticipated trends in the aviation industry as a whole. National and State trends provide insight for the development of aviation activity projections for the airports in the Regional Aviation System. These activity projections will be used to evaluate the ability of the existing system to accommodate projected aviation demand and to plan future facilities for the system. Some trends in the aviation industry will undoubtedly have a greater impact on Pima County than others; and it is possible that some trends anticipated and discussed in this chapter may have no pronounced impact on the regional aviation environment.

Trends in the commercial airline industry could impact air service at Tucson International Airport. Trends in general aviation are also important to consider since eight of the nine airports in the Regional Aviation System accommodate some segment of general aviation activity. The vast majority of Pima County airports support only general aviation aircraft operations. This chapter documents the following three components: recent commercial trends, anticipated commercial trends, and trends affecting general aviation activity.

Trends presented in this chapter are for the U.S. as a whole, and are intended to provide a general frame of reference for the reader of this report. The trends analysis sets the stage for an understanding of how aviation activity in Pima County compares to aviation in the country, and it establishes a basis for predicting how aviation may be expected to grow and change in the future.

Recent Commercial Trends

The airline industry operates in a perpetual state of adjustment and change. During the last 20 years, the United States experienced unprecedented change. Where competition sparred by low-fare carriers has prevailed, air passengers have reaped the rewards. At single-carrier dominated hubs and smaller local airports, passengers have paid, on average, much higher fares.

The 1990s was a period for mergers, global alliances, and joint marketing agreements, as well as domestic alliances between major and regional carriers. There have been significant structural changes in the way airlines conduct business. The airlines have examined every aspect of their operations to reduce costs. The regional carriers, with lower labor costs, came into their own, as shorter haul service to hub airports

was turned over to the regional carriers. The major carriers have now reentered this segment of the airline business through acquisition of the regional carriers and by replacement of turboprops with regional jets. This process has left smaller cities with few options for air service.

Four major factors have shaped today's commercial airline industry; they are as follows:

- **A Robust, But Cyclical Economy:** Trends in commercial passenger boardings, when compared to the U.S. Gross Domestic Product (GDP), indicate a direct relationship between periods of GDP growth and decline to periods of increases and decreases in the total number of U.S. commercial passenger boardings. These trends clearly indicate that the airline industry and commercial passenger traffic are significantly impacted by upturns and downturns in the U.S. economy.
- **Over-Expansion Of The Airline Industry In The Late 1980s:** The over-expansion of the airline industry experienced in the late 1980s was a major factor causing airlines to lose over \$13 billion during the early 1990s, the largest losses ever experienced. As a result of these losses, airlines were forced to reevaluate their systems and make the following changes:

Implement major adjustments to their route structures, concentrating on the most profitable routes;

Eliminate secondary connecting hubs and introduce point-to-point service between larger markets;

Focus on the development of strategic marketing alliances with regional carriers in the U.S. and other airlines abroad; and

Rationalize aircraft fleets that, on average, offered lower operating costs.

- **Widespread Adoption Of Similar, Successful Strategies By Each Of The Major Carriers:** The three- to five-year planning horizons, under which most airlines operate, allow them to observe and quickly emulate the successful strategies of their competitors. This copycat approach to providing air service has resulted in several episodic waves of strategic changes by the airlines. The following are examples of the types of actions that have been taken by most major airlines:

Development of hub fortresses to capture and control traffic flows;

Initiation of frequent flyer programs;

Emulation of Southwest Airlines;

Code-sharing alliances with regional carriers;

Replacement of with turboprops with regional jet aircraft;

Abandonment/reduction of 19-seat aircraft; and

Acquisition of whole or part of code-sharing partners.

Widespread adoption of these strategies has intensified their impact on air service within the U.S.

- **Technological Advances Including Computer Reservation Systems, Yield Management, and E-Commerce:** The use of computers has had a profound impact on the air carrier industry from the standpoint of operations, marketing, pricing, and ticket distribution. One of the most significant changes has been the ability of airlines to implement Yield Management Systems that allow

them to constantly track prices, bookings, and fare information. These systems allow airlines to have up-to-the-minute information about passenger demand and fares. This real-time information allows airline pricing departments to constantly adjust fares, frequently over one million times per day, and to adjust the number of seats and airfares to maximize load factors and revenues. In addition, growth in the use of electronic and paperless tickets and the direct purchase of tickets from the airlines, as opposed to the traditional travel agent process, has also significantly impacted the industry.

Past Commercial Service Trends

Prior to 1978, the Civil Aeronautics Board (CAB) regulated service points, service frequency, types of planes used to provide service, and fares. This regulation guaranteed airline profitability. However, since airline deregulation, carriers have made service decisions based on traditional market-driven supply and demand concepts. Carriers are in the business to make a profit; they continually review existing and potential markets to rationalize the service they provide to this end. It has become critical for airlines to lower their operating costs in order to sustain profits in the increasingly competitive environment, particularly in regard to low-cost, new entrant carriers. Adjustments are made to direct airline resources (scheduled flights) to those markets where the carrier determines it has the greatest potential to make a profit.

Between 1990 and 1993, U.S. carriers experienced heavy financial downturns. This was tied closely to the cycles of the economy. During this time, the summed operating losses of all airlines exceeded all profits made by the airline industry since its inception. Due to the economic downturn and the simultaneous over-expansion of the airline industry, losses during the 1990-1993 period exceeded \$13 billion.

The steady growth in the U.S. economy in the mid and late 1990s, coupled with changes in airline operating practices, resulted in a period of significant growth in total commercial passenger traffic. During this time, the U.S. Gross Domestic Product (GDP) grew at very strong rates and the airlines experienced one of their most prosperous periods in history, earning a total of \$23 billion between 1995 and 2000. The actions that helped return the carriers to a profitable operating scenario included the following:

- Carefully planned increases in seating capacity and maximization of frequencies to achieve higher load factors;
- Implementation of major adjustments to their route structures, concentrating on the most profitable routes;
- Reducing the number of connecting hub complexes and increased point-to-point service in the larger markets;
- Strengthening relationships with and transferring short-haul routes to regional code-sharing partners ; and
- Utilization of smaller aircraft with lower seating capacities, first turboprop aircraft and then the regional jet.

These changes paid off for the airlines in the mid- to late 1990s. However, by 2000, airline revenues that accumulated in the 1990s began to dissipate. By 2000, airline operating profits were slowing as a result of a stagnant economy. In the second quarter of 2001, U.S. GDP rose only 0.2 percent, compared to 5.7

percent increase in the second quarter of 2000. By early 2001, technology and telecommunications firms announced substantial layoffs, the stock market dropped to the lowest levels in two years, and consumer confidence was rated the lowest since 1996. The terrorist attacks on the U.S. on September 11, 2001, sent the U.S. economy spiraling even further downward.

Carrier Mergers, Alliances, and Code-share Agreements

Throughout the last half of the 1990s, many U.S. major/national carriers proposed consolidation and alliances. This was a pattern that had characterized the nation's commercial airline industry during the 1980s. In early 1998, marketing alliances were proposed to combine six of the major U.S. airlines. Northwest and Continental, United and Delta, and American and US Airways each tried to form partnerships. However, due to disagreements between the carriers and antitrust concerns, most of the agreements fell through.

More recently, mergers and acquisition have again been initiated. In May 1999, United moved forward in an attempt to merge with US Airways. United offered to pay US Airways \$4.3 billion in cash and to assume \$7.3 billion in debt and long-term leases. Fourteen months after the initial proposal, facing big losses, a worsening economy, and labor problems, United wanted to withdraw the merger agreement. Later in the month, the U.S. Department of Justice officials said that the proposed merger, which would have created the world's largest airline, would have reduced competition, raised fares, and harmed consumers. This ended all chances of a merger between United and US Airways. Earlier in April 2001, American Airlines responded with the successful acquisition of Trans World Airlines. Trans World filed for Chapter 11 bankruptcy earlier in 2001. With this acquisition, American captured about 25 percent of the U.S. passenger market for domestic airline travel.

Many alliances are also being formed that involve marketing agreements between U.S. domestic carriers and foreign partners. Carriers across the world are joining forces to obtain market access, exchange technical expertise, provide capital for investment, and reduce costs. The following three major alliances are currently in place: 1) STAR alliance led by United Airlines and Lufthansa, 2) Oneworld led by American Airlines and British Airways, and 3) SkyTeam led by Delta Airlines and Air France. Global alliances, as well as open skies agreements, are raising questions concerning strict limits on foreign shareholding in U.S. airlines and refusal to let foreign carriers provide passenger services between U.S. cities. Open skies agreements eliminate restrictions as they relate to flight frequency, aircraft type, and airfares. The U.S. currently has over 50 open skies agreements with foreign countries, including the new additions of Poland and France in 2001.

Increased Fuel Prices

Carriers worldwide cited high fuel prices as one of the reasons for their poor performance in 2000-2001. Although there has not been a shortage of aviation fuel since the fuel crisis of 1974, the price of aviation fuel continues to be an important and uncertain factor impacting airline-operating costs. In 1999, nearly 9 percent of all airline costs were associated with jet fuel. Fluctuating fuel prices have caused corresponding fluctuations in airline revenue and concurrent increases in airfares. Fuel costs rose 75 percent, from 44 cents per gallon in 1999 to 77 cents per gallon in the first quarter of 2000. The rising jet fuel prices threaten airline profitability, especially for carriers with older aircraft and those without fuel hedging strategies. This latter category included Midway Airlines, who declared bankruptcy in August 2001.

Rising Labor Costs

In recent years, major airlines have faced rising labor costs, which average 34 percent of the costs for the major carriers. Labor expenses have been intensified by large jumps in pilot pay, which also “raised the bar” for flight attendants and mechanics. Airlines often experience serious work slowdowns, sickouts, and refusals to work overtime during contract negotiations. The United Airlines pilots’ labor contract, signed in August 2000, is threatening the financial health of all U.S. major/national carriers. The contract made United’s pilots the highest paid in the industry raising worker expectations throughout an industry known for labor groups trying to top the last in contract gains. In May 2001, Comair pilots began an 89-day strike, costing Delta an estimated \$2 million per day in revenues. United, American, Northwest, and Delta all faced difficult contract negotiations with pilots, mechanics, and/or flight attendants in 2001. All contracts lead to increased airline costs, which are ultimately passed on to the American traveler.

This competitive labor environment means slower growth and less profitability for carriers. Major/national carriers often must raise fares to compensate for labor-related losses. Fare increases by the majors, in some cases, have caused market shares to shift to low-fare airlines, even in the less-sensitive business travel sector. Airline business travel dropped 30 percent between January and September of 2001. This largely resulted from increased business fares, coupled with the onset of an economic downturn.

Information Technology and E-Commerce

The evolution and use of information technology has had a large impact on the commercial air service industry in terms of operations management, ticket pricing and distribution, and marketing. More advanced yield management systems have allowed carriers to constantly track prices, bookings, and fare data. Computerized systems allow airlines to have up-to-the-minute information about passenger demand and fares, which in turn allows them to continually adjust the number of seats offered at certain fares to maximize load factors and revenue.

In addition, the growth in the use of electronic and paperless tickets, as well as the direct purchase of tickets from the airlines (as opposed to the traditional travel agent process), has also significantly impacted the industry. With the introduction of e-commerce through electronic ticketing and the use of the Internet for product distribution, the commercial air service industry estimates it is saving \$3.5 billion annually.

Anticipated Commercial Trends

The past commercial airline trends are those from which the Federal Aviation Administration (FAA) has developed forecasts of future levels of commercial passenger activity. The most recent forecasts of commercial passenger activity, presented by the FAA in *FAA Aerospace Forecasts, Fiscal Years 2001-2012*, reflect strong growth in both domestic and international passenger activity at U.S. airports.

Based on the FAA’s forecast of continued, yet slowing, economic expansion in the U.S., commercial passenger enplanements in the U.S. are anticipated to experience sustained growth through 2012. The FAA projects that total domestic passenger enplanements on large U.S. carriers and regional/commuter carriers, combined, will increase from approximately 639.1 million in 2000 to approximately 982.9 million in 2012, representing an average annual growth rate of approximately 3.6 percent. International

passenger enplanements are projected to increase from approximately 54.6 million in 2000 to approximately 111.0 million in 2012. This growth represents a relatively robust forecasted average annual growth rate of approximately 6.1 percent.

Table 4-1 presents a summary of historic passenger enplanement levels at U.S. airports, as well as the FAA's most recent domestic and international passenger enplanement forecasts (large air carriers and regional/commuter carriers) between 2000 and 2012. U.S. total passenger enplanement data presented in Table 4-1 is also depicted in **Exhibit 4-1**.

Table 4-1
PROJECTION OF U.S. AIR CARRIER ENPLANEMENTS

Year	Domestic Enplanements (millions)	International Enplanements (millions)	Total Enplanements (millions)
Historical			
1995	531.1	48.6	579.7
1996	558.1	50.0	608.1
1997	579.1	52.3	631.4
1998	590.4	53.1	643.5
1999	612.9	53.3	666.2
2000	639.1	54.6	693.7
Average Annual Growth Rate			
1995-2000	3.8 %	2.4 %	3.7 %
Forecast			
2001	657.2	58.1	715.3
2002	678.1	62.1	740.1
2003	702.2	66.4	768.6
2004	728.8	70.8	799.6
2005	757.8	75.2	833.1
2006	788.4	79.6	868.0
2007	818.8	84.1	902.9
2008	849.5	89.1	938.6
2009	881.1	94.3	975.4
2010	913.8	99.8	1,013.5
2011	947.7	105.4	1,053.1
2012	982.9	111.0	1,093.9
Average Annual Growth Rate			
2000-2012	3.6%	6.1 %	3.9 %

Source: *FAA Aerospace Forecasts, Fiscal Years 2001 – 2012*
Variances in totals due to rounding of spreadsheet data.

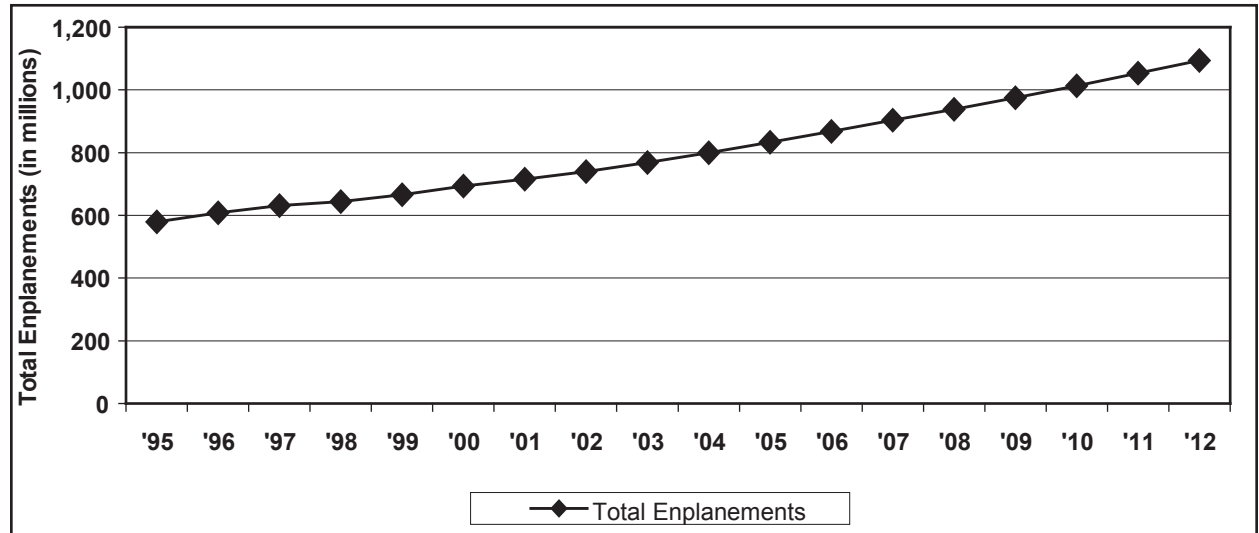
average passenger trip length is expected to increase from 832.3 to 887.3 miles; average seats per aircraft departure will increase from 139.3 to 147.4; and the average load factor is expected to drop slightly from 70.9 percent to 70.5 percent.

Current FAA forecasts for commercial passenger activity reflect relatively strong growth. Domestic passenger enplanements are projected to increase at an average annual rate of approximately 3.6 percent from 2000 to 2012, slightly below the actual growth rate experienced at U.S. airports between 1995 and 2000. International passenger enplanements are projected to increase at an average annual rate of approximately 6.1 percent over the forecast period, a rate significantly greater than the 2.4 percent average annual growth rate experienced between 1995 and 2000.

According to FAA Aerospace Forecasts, Fiscal Years 2001-2012, between 2000 and 2012 air carrier aircraft operations are projected to increase from 15.2 million to 21.8 million; the

Exhibit 4-1

PROJECTION OF TOTAL U.S. AIR CARRIER ENPLANEMENTS



Source: *FAA Aerospace Forecasts, Fiscal Years 2001 – 2012*

The FAA also forecasts that aircraft operations for regional/commuter carriers will increase from 10.8 million to 14.3 million between 2000 and 2012; the average passenger trip length is expected to increase from 280.4 to 338.8 miles; average seats per aircraft departure will increase from 37.5 to 46.0; and the average load factor is expected to increase from 59.0 percent to 62.8 percent.

Trends Affecting General Aviation

The decline in general aviation that began in 1978 resulted in the loss of 100,000 manufacturing jobs; in addition, aircraft production dropped from 18,000 aircraft to only 928 aircraft in 1994. Based on more recent aircraft trends, the FAA now has a more positive outlook for the general aviation industry. Future growth is reliant on the industry's actions to stimulate the development and production of new general aviation products and services. According to FAA Aerospace Forecasts, the general aviation industry contributed the following to the U.S. economy in 1998:

- Economic activity totaling \$64.5 billion
- 6.6 percent of aviation's total contribution (\$976 billion) to the U.S. economy
- 638,000 jobs with an annual payment of \$19.9 billion

General aviation aircraft are defined as all aircraft that are not flown by airlines or the military; this class of aircraft operates at all airports being analyzed in the RASP. Following a decline that lasted throughout most of the 1980s and into the mid-1990s, the general aviation industry and general aviation activity appear to be revitalized.

The enactment of the General Aviation Revitalization Act of 1994, which established an 18-year Statute of Repose on all general aviation aircraft and components, in terms of liability to the manufacturer, signaled a significant change in the industry. This Act spurred manufacturers such as Cessna and Piper

Aircraft to reenter the single-engine piston-manufacturing sector. In January 1997, Cessna produced its first new single-engine aircraft since 1986. Lancer International, Diamond Aircraft, and Mooney are also producing new piston aircraft.

The positive impacts the Act has had on the general aviation industry since its passage are reflected in current statistics. Since 1994, statistics indicate an increase in general aviation activity, an increase in the active general aviation aircraft fleet, and an increase in shipments of fixed-wing general aviation aircraft. These recent positive trends in the general aviation industry are anticipated to continue. In addition, the general aviation industry is giving increased attention to “learn to fly” educational and promotional activities that should bring new pilots and aircraft mechanics into the industry.

Specific trends related to general aviation activity, as identified in the FAA Aerospace Forecasts, Fiscal Years 2001-2012, developed by the U.S. Department of Transportation and other national groups, are discussed in following sections.

Aircraft Shipments and Billings

The General Aviation Manufacturers Association (GAMA) tracks and reports total shipments and billings of general aviation aircraft. GAMA statistics for 2000 indicate continued strong growth in the sale of general aviation aircraft, both piston and turbojet. Year 2000 general aviation shipments totaled 2,816 aircraft, an increase of approximately of 12.5 percent over 1999; 2000 represents the sixth consecutive year of increased demand for general aviation aircraft. Statistics also indicate growth in turboprop and jet aircraft shipments are outpacing other sectors of the general aviation aircraft market. A number of factors contribute to this increase in general aviation aircraft shipments, including the introduction of new aircraft (including three new Cessna Citation business jets); increases in the number of fractional ownership arrangements; and increases in the number of traditional corporate flight departments.

GAMA also tracks total billings of general aviation aircraft, for both domestic and international customers. During 2000, aircraft billings totaled over \$8.6 billion, an increase of approximately 9.1 percent over total 1999 billings. Total billings have nearly quadrupled since the early 1990s. Currently, international general aviation shipments and billings represent nearly 21 percent of the U.S. manufactured aircraft.

Table 4-2 presents annual total general aviation aircraft shipments and billings, for the period 1990 -2000.

GAMA statistics illustrate the recent strength of the general aviation aircraft manufacturing industry. In addition to the increases in total shipments and billings for general aviation aircraft, it is important to note that the strongest growth is in the jet and turboprop segments of the market. The growth in these segments can be attributed to increased business use of aircraft and the desire of corporate users to operate safe, efficient, high-performance aircraft. These high-performance aircraft require airport facilities developed to a more demanding standard, a factor to be considered as system development plans are identified.

Table 4-2
HISTORIC GENERAL AVIATION AIRCRAFT SHIPMENTS AND BILLINGS

Year	Total General Aviation Aircraft Shipments	Total General Aviation Aircraft Billings (\$ millions)
1990	1,144	2,007.5
1991	1,021	1,968.3
1992	941	1,839.6
1993	964	2,143.8
1994	928	2,357.1
1995	1,077	2,841.9
1996	1,130	3,126.5
1997	1,569	4,674.3
1998	2,200	5,873.9
1999	2,504	7,843.6
2000	2,816	8,558.4

Source: General Aviation Manufacturers Association

Active Pilots

Each of the four major segments of the pilot population (student pilots, private pilots, commercial pilots, and airline transport pilots) experienced growth in 1999. As a result, the number of active pilots increased to approximately 648,539 in 2000, an increase of 8,426 pilots compared to 1999. One of the strongest growth rates was in the student pilot population, which increased by approximately 7.0 percent. These students represent the future of general aviation. Student pilots are not only learning to fly for recreational

reasons, but also because of career opportunities created by the needs of air carriers, fractional ownership providers, and corporate flight departments. Also worth noting is the 2.0 percent growth rate in instrument-rated pilots. Approximately 48.6 percent of the active pilot population is instrument-rated, another reflection of the increasing sophistication of aircraft and pilots in the general aviation sector.

The FAA has developed forecasts of the future pilot population, by certificate type, based on historic trends, as well as anticipated trends. These projections estimate that the total active pilot population in the U.S. will increase from 648,539 in 2000 to 827,177 by 2012, representing an average annual growth rate of approximately 2.0 percent.

As shown in **Table 4-3**, the student and airline transport categories of pilots are anticipated to experience the strongest growth over the 12-year forecast period, experiencing average annual growth rates of 2.7 percent and 3.2 percent, respectively. The populations of both private and commercial pilots are anticipated to increase at an average annual rate of 1.4 percent over the forecast period.

Exhibit 4-2 compares the average annual growth rate projected by pilot type for the period 2000 to 2012. The data presented in Exhibit 4-2 show relatively strong growth, ranging from an average annual rate of 1.1 percent in the “other” pilot category to an average annual rate of 3.2 percent in the airline transport pilot category. The strong growth anticipated in the student pilot category is important to note because of the potential impacts this growing number of pilots may have on all components of general aviation activity in the future. Student pilots, in most cases, will graduate to become active private, commercial, and/or airline transport pilots, which in turn may impact the active aircraft fleet and general aviation activity statistics.

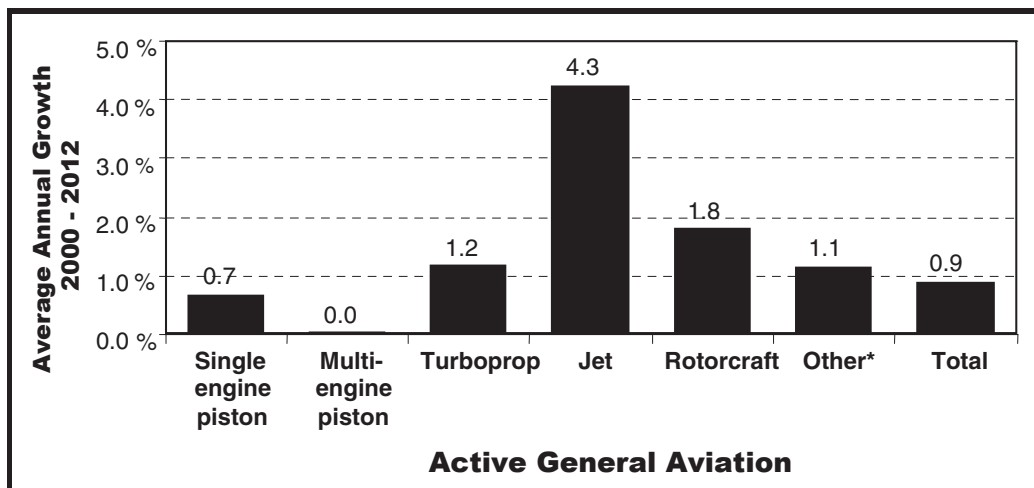
Table 4-3
PROJECTION OF ACTIVE PILOTS, BY TYPE OF CERTIFICATE

Year	Student	Private	Commercial	Airline Transport	Other*	Total
Historical						
1993	103,583	283,700	143,014	117,070	17,702	665,069
1994	96,254	284,236	138,728	117,434	17,436	654,088
1995	101,279	261,399	133,980	123,877	18,649	639,184
1996	94,947	254,002	129,187	127,486	16,639	622,261
1997	96,101	247,604	125,300	130,858	16,479	616,342
1998	97,736	247,226	122,053	134,612	16,671	618,298
1999	97,359	258,749	124,261	137,642	17,461	640,113
2000	104,150	260,700	126,200	139,700	17,789	648,539
Average Annual Growth Rate						
1995-2000	0.6%	-0.1%	-1.2%	2.4%	-0.9%	0.3%
Forecast						
2001	107,600	267,400	128,400	144,400	18,104	665,904
2002	110,500	272,000	130,600	149,500	18,348	680,948
2003	113,500	277,500	133,300	154,400	18,563	697,263
2004	116,600	283,700	136,300	159,300	18,717	714,617
2005	119,700	288,000	138,300	164,000	18,882	728,882
2006	122,900	291,400	139,900	169,300	19,076	742,576
2007	126,200	294,600	141,500	174,400	19,265	755,965
2008	129,600	297,600	142,900	180,000	19,465	769,565
2009	133,100	300,600	144,300	186,000	19,664	783,664
2010	136,700	303,600	145,800	192,000	19,829	797,929
2011	140,400	306,600	147,300	198,100	20,003	812,403
2012	144,200	309,600	148,800	204,400	20,177	827,177
Average Annual Growth Rate						
2000-2012	2.7%	1.4%	1.4%	3.2%	1.1%	2.0%

Sources: FAA U.S. Civil Aviation Registry; FAA Aerospace Forecasts, Fiscal Years 2001 – 2012

*Other pilot category includes pilots with recreational, rotorcraft-only, and glider-only certificates.

Exhibit 4-2
PROJECTED GROWTH OF ACTIVE PILOTS, 2000-2012



Source: FAA Aerospace Forecasts, Fiscal Years 2001 - 2012

* Includes aircraft classified by FAA as experimental and other.

Aircraft Fleet

The FAA annually tracks the number of active general aviation aircraft in the U.S. Active aircraft are those aircraft that are currently registered and fly at least one hour during the year. By tracking this information, the FAA is able to

identify trends in the total number of active aircraft, as well as the types of aircraft operating in the active fleet. Based on FAA estimates, the active general aviation aircraft fleet is anticipated to increase from 221,213 aircraft in 2000 to 245,965 in 2012, representing an average annual growth rate of approximately 0.9 percent. FAA forecasts for the total active aircraft fleet, as well as each major type of aircraft, are summarized in **Table 4-4**.

As shown in Table 4-4, the total active aircraft fleet is forecasted to experience an average annual growth rate of less than 1 percent between 2000 and 2012. One of the most important trends identified by the FAA in these forecasts is the relatively strong growth anticipated in active jet aircraft. This trend illustrates a movement in the general aviation community towards higher-performing, more demanding aircraft. This trend will impact the types of activities needed at general aviation airports and the types of facilities that may be required at those airports.

Table 4-4
PROJECTED U.S. ACTIVE GENERAL AVIATION AIRCRAFT FLEET

Aircraft Type	2000	2012	Average Annual Growth Rate
Single-engine piston	151,640	164,800	0.7%
Multi-engine piston	21,143	21,200	0.0%
Turboprop	5,736	6,600	1.2%
Jet	7,440	12,280	4.3%
Rotorcraft	7,649	9,460	1.8%
Other *	27,605	31,625	1.1%
TOTAL	221,213	245,965	0.9%

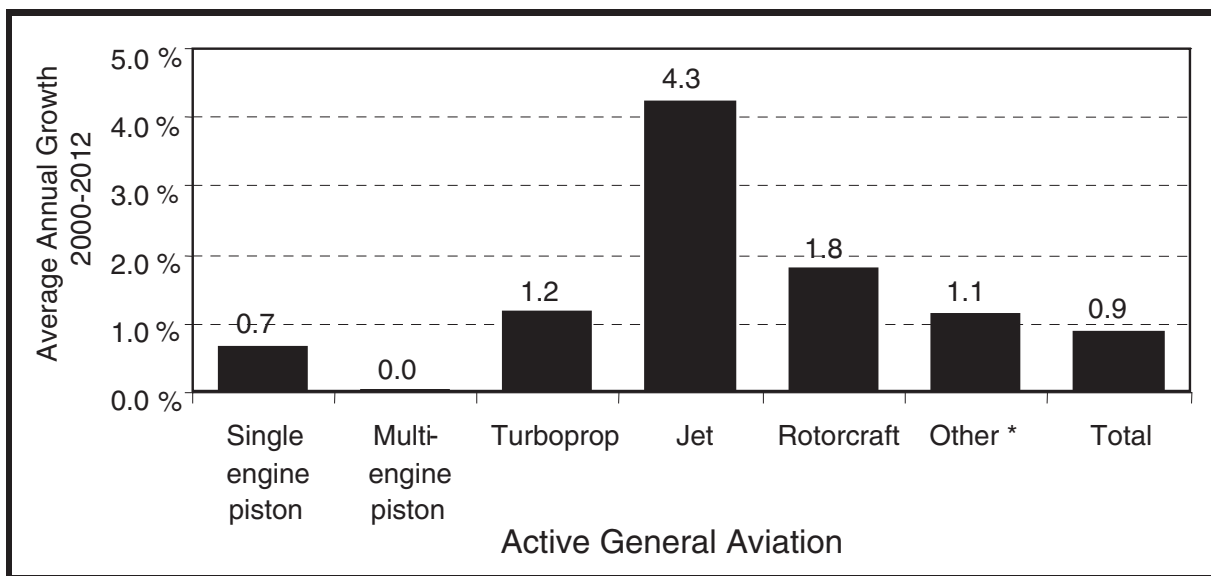
Source: FAA Aerospace Forecasts, Fiscal Years 2001-2012

* Includes aircraft classified by FAA as experimental and other.

Exhibit 4-3 compares the projected average annual growth rate for each type of aircraft in the fleet over the period from 2000 through 2012. The graph illustrates the extent to which the growth in jet aircraft is projected to significantly outpace growth in all other segments of the general aviation aircraft fleet. As shown, turboprop, rotorcraft, and other aircraft are projected to experience an average annual growth rate of over 1 percent per year over the forecast period, while the number of active multi-engine piston aircraft is anticipated to remain stable over the forecast period.

Exhibit 4-3

GENERAL AVIATION AIRCRAFT AVERAGE ANNUAL GROWTH RATES 2000-2012



Source: FAA Aerospace Forecasts, Fiscal Years 2001-2012

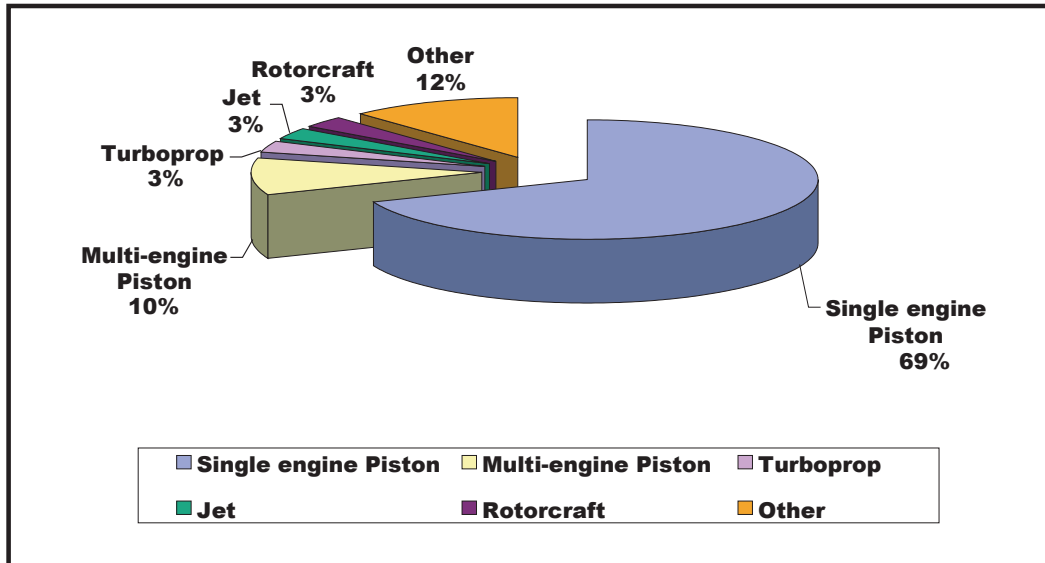
* Includes aircraft classified by FAA as experimental and other.

An examination of the existing and projected percentage of each aircraft class in the active aircraft fleet in terms of the respective represented.

Exhibit 4-4 presents existing year 2000 mix of active general aviation aircraft, and **Exhibit 4-5** presents the projected mix for the general aviation fleet in 2012.

Forecast data prepared by the FAA indicates the total number of general aviation aircraft for each component of the fleet mix will either remain steady (multi-engine piston) or grow; as general aviation aircraft figures grow, not a single category is predicted to falter. Data depicted in the previous exhibits indicates that jet and other aircraft will be the only components of the general aviation aircraft fleet mix that will see their share of the active fleet grow over the forecast period. Jet aircraft are anticipated to grow from approximately 3 percent of the active general aviation fleet in 2000, to approximately 5 percent of the active fleet by 2012; this indicates the relative increase in sophistication anticipated in the active aircraft fleet and pilot population. The “other” category of aircraft is also forecast to become a larger component of the active general aviation fleet (primarily because of growth in experimental aircraft), growing from approximately 12 percent of the fleet to 13 percent of the fleet by 2012.

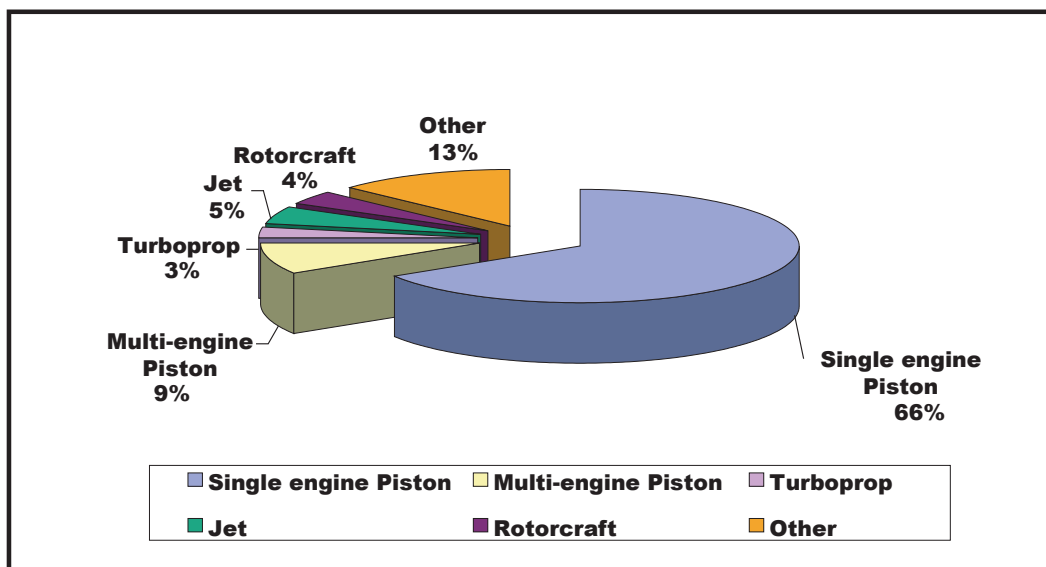
Exhibit 4-4
GENERAL AVIATION AIRCRAFT FLEET MIX, 2000



Source: FAA Aerospace Forecasts, Fiscal Years 2001-2012

Notes: *Other* includes both gliders and lighter-than-air aircraft.

Exhibit 4-5
PROJECTED GENERAL AVIATION AIRCRAFT FLEET MIX, 2012



Source: FAA Aerospace Forecasts, Fiscal Years 2001-2012

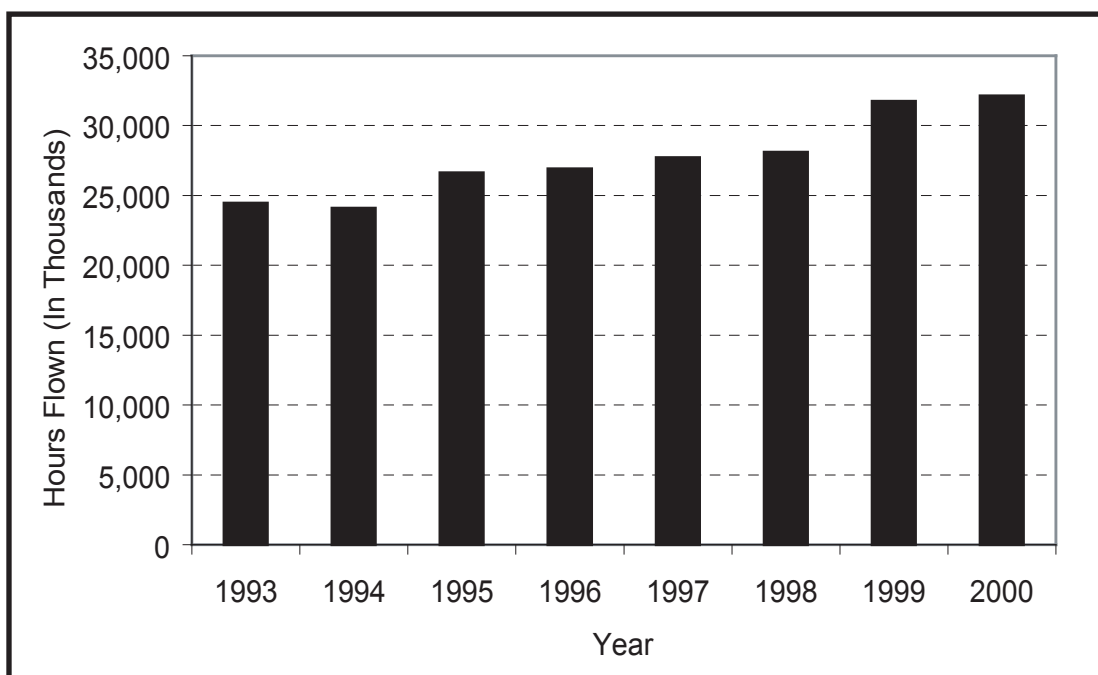
Notes: *Other* includes both gliders and lighter-than-air aircraft.

Hours Flown

Hours flown in general aviation aircraft were at a 16-year low in 1994. Similar to other general aviation trends, hours flown have increased since 1994 as well. Exhibit 4-6 diagrams general aviation hours flown from 1993 to 2000. According to the FAA, the active general aviation fleet is forecast to grow by 0.9 percent annually over the next 12-years, and the projected increase in the average annual rate of growth in hours flown is forecast at 2.1 percent. By 2012, hours flown are estimated at 41.7 million, compared to 32.1 million in 2000.

Exhibit 4-6

TOTAL U.S. GENERAL AVIATION HOURS FLOWN



Source: FAA Aerospace Forecasts, Fiscal Years 1999-2010

Business Use of General Aviation Aircraft

Many businesses throughout the U.S. depend on scheduled commercial service airlines, as well as on general aviation aircraft, to add to their productivity and efficiency. The Regional Aviation System is essential to businesses in Pima County. Without an efficient airport system, the Region would be severely hampered in its ability to participate in an increasingly global community and marketplace. There is often no practical alternative to air transportation in today's marketplace.

Many of the nation's leading employers that use general aviation as a business tool are members of the National Business Aircraft Association (NBAA). Data from NBAA shows that many of the top U.S. businesses use general aviation aircraft. The NBAA's Business Aviation Fact Book 2000 indicates that approximately 70 percent of all businesses included in the Fortune 500 operate general aviation aircraft. In addition, 90 of the Fortune 100 companies operate general aviation aircraft.

Business use of general aviation aircraft can range from the rental of small, single-engine aircraft to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. The use of general aviation aircraft allows employers to efficiently transport priority personnel and air cargo. Businesses use general aviation aircraft to link multiple office locations and to reach existing and potential customers. The use of business aircraft by smaller companies has escalated as various chartering, leasing, time-sharing, interchange agreements, partnerships, and management contracts have emerged.

NBAA statistics indicate that the number of flight departments among the nation's businesses increased from 6,584 in 1991 to 8,778 in 1999, an increase of approximately 33 percent. Fractional ownership arrangements have also experienced a recent trend of rapid growth. In 1998, NBAA estimated that 1,125 companies used fractional ownership arrangements; by 1999 that number had grown to 1,693 companies, a growth of over 50 percent in a single year. It is because of this growing business use that it will be important for the PAG RASP to analyze the Regional Aviation System's ability to meet the needs of corporate aircraft and business users.

September 11 Impacts On General Aviation

On September 11, 2001, hijacked commercial jet airliners destroyed the World Trade Center's twin towers in New York City and significantly damaged the Pentagon building in Washington, D.C. Since September 11, 2001, short haul, one-day trips via commercial carriers have been more difficult and in some cases impossible. Many of the nation's airlines cut their flight frequency following September 11, in an effort to achieve economic stability. The evening hours endured most of these capacity cuts, making it impossible in some cases for business travelers to make one day trips. This resulted from the fact that subsequent arrival and departure schedules do not provide sufficient time for the traveler to conduct their business. Increased security has also impacted short haul trips. Little advantage is gained by flying commercially if the travel destination is within a five to six hour drive, when travelers must allow additional time for security screening on both ends of their trip. in addition to airport travel and flight times.

These conditions have resulted in an increase in business use of general aviation. Since September 11, increases in air taxi, charter, and Part 135 operations have been recorded. More companies are investigating either outright or fractional ownership of general aviation aircraft. These trends are expected to continue in the near term, boosting general aviation activity nationwide and will be considered as the RASP is developed.

Summary

Both the commercial and the general aviation industries are continually changing. It is important to understand how both commercial and general aviation have changed and how they are expected to change in the coming years. Having a grasp of historic and future trends in the aviation industry is important to developing realistic projections of demand for the Regional Aviation System. Information presented in this chapter will be used in the next element of the RASP, Projections of Demand, to develop forecasts of various demand components for the Region and for Study airports.

